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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/891,032	06/25/2001	Stephen D. Hanna	BLD92000047US1	9462
7590	09/30/2004		EXAMINER	
Brian C. Kunzler 10 West 100 South Salt Lake City, UT 84101			SORRELL, ERON J	
			ART UNIT	PAPER NUMBER
			2182	

DATE MAILED: 09/30/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

RECEIVED

OCT 29 2004

Technology Center 2100

Office Action Summary

Application No.	Applicant(s)	
09/891,032	HANNA ET AL.	
Examiner	Art Unit	
Eron J Sorrell	2182	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on _____.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-28 is/are pending in the application.
 - 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) 13 is/are allowed.
- 6) Claim(s) 1-4,8,9,14-19, and 23-25 is/are rejected.
- 7) Claim(s) 5-7,10-12,20-22 and 26-28 is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 25 June 2001 is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) Notice of Informal Patent Application (PTO-152)
- 6) Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 14,16-19, and 23 are rejected under 35 U.S.C. 102(e) as being anticipated by Terashima et al. (U.S. Patent No. 6,538,762).

3. Referring to claim 14, Terashima teaches a system for transmitting a plurality of data types over a plurality of transmission paths comprising:

a memory module configured to store a plurality of compressed and non-compressed data types (see lines 51-57 of column 5; Note the commands comprise three parts a command code and parameter which are not compressed and the data which may or may not be compressed (see lines 1-5 of column 5));

a handshaking control module configured to control the data flow of a distinct stream of data into a data processing module (see lines 33-38 of column 8; note the command analysis section is the handshaking module and directs the data to decompression module); and

a data processing module configured to receive and process the transmitted data in accordance with the type of the transmitted data (see lines 33-38 of column 8; note the decompression module is the data processing module and it decompresses and forwards the data if it is compressed and simply forwards the data if it is not compressed).

4. Referring to claim 16, Terashima teaches the handshaking control module (command analysis section) is further configured to receive data from a host and place the received data into the memory module (see figure 5 and lines 42-57 of column 5).

5. Referring to claim 17, Terashima discloses the handshaking module is configured to place the data received into one of the plurality of FIFO buffers depending on the type of data received (see lines 42-57 of column 10).

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6. Referring to claim 18, Terashima discloses the handshaking control module is configured to receive requests for print data from the data processing module (see figure 3) Note item labeled 5 corresponds to the handshaking module).

7. Referring to claim 19, Terashima discloses the handshaking control module is configured to place the data requested from the data processing module on the data bus appropriate for the data type requested (see items labeled 59 and 61 in figure 5).

8. Referring to claim 23, Terashima discloses the data processing module is configured to evaluate header information relating to the print job to determine what types of data to request from the handshaking control module (see lines 1-41 of column 5).

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the

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art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Terashima in view of Kumpf et al. (U.S. Patent No. 6,412,022 hereinafter Kumpf).

11. Referring to claim 15, Terashima fails to teach storing the data in a plurality of First-In First-out (FIFO) buffers.

Kumpf teaches, in an analogous system, storing the data in a plurality of First-In First-out (FIFO) buffers (see items labeled 18 in figure 2).

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify method of Terashima with the above teachings of Kumpf in order to queue the data if the printers are busy as suggested by Kumpf (see paragraph bridging columns 4 and 5).

12. Claims 24 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Terashima in view of Har et al. (U.S. Patent No. 6,310,563 hereinafter Har).

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13. Referring to system claim 24, Terashima fails to disclose the method further comprising reading a word of the data in to a data decompression module every one half-clock cycle.

In an analogous system, Har teaches reading a word of the data into a data decompression module every one-half clock cycle (see lines 41-62 of column 11).

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the system of Terashima such that it comprises reading a word of the data in to a data decompression module every one half-clock cycle. One of ordinary skill in the art would have been motivated to make such modification in order to reduce potential bottlenecks in the system as suggested by Har (see lines 41-62 of column 11).

14. Referring to claim 25, Har teaches multiplexing the different types of data and processing each type of data received in accordance with the type (see item labeled 180 figure 1).

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the system of Terashima, with the above teaching of Har. One of ordinary skill in the art would have been motivated to make such

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modification in order to prevent errors from occurring due to processing data incorrectly.

15. Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Terashima in view of Katsunori (JP 5030366 A) and further in view of Kumpf et al. (U.S. Patent No. 6,412,022 hereinafter Kumpf).

16. Referring to claim 1, Terashima teaches a method comprising:

storing data of a plurality of compressed and non-compressed data types (see lines 51-57 of column 5 and lines 33-38 of column 8; note the data can be compressed or non-compressed);

receiving requests for the stored data (see paragraph bridging columns of 8 and 9);

Terashima fails to teach the limitations of transmitting distinct streams of data of both the compressed and non-compressed data types over each of a plurality of transmission paths and processing the transmitted data in accordance with the type of transmitted data after the transmission of the data.

Katsunori teaches an analogous system wherein transmitting distinct streams of data of both the compressed and non-

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compressed data types over a single transmission path (see paragraphs 6,12, and 17 of the translated copy) and processing the transmitted data in accordance with the type of transmitted data after the transmission of the data (see paragraph 14 of the translated copy).

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the teachings of Katsunori. One of ordinary skill in the art would have been motivated to make such modification in order to shorten the data transmission time as suggested by Katsunori (see paragraph 4 of the translated copy).

The combination of Terashima and Katsunori fails to teach transmitting both the compressed and non-compressed data over a plurality of paths.

Kumpf teaches an analogous system wherein data is transmitted to a plurality of printers over a plurality of transmission paths (see lines 28-46 of column 2).

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the combination of Terashima and Katsunori with the above teachings of Katsunori. One of ordinary skill in the art would have been motivated to make such modification in order to support multiple

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communication channels between the peripheral and the controller as suggested by Kumpf (see lines 65-67 of column 1).

17. Referring to claim 2, Kumpf teaches storing the data in a plurality of First-In First-out (FIFO) buffers (see items labeled 18 in figure 2).

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify method of Terashima with the above teachings of Kumpf in order to queue the data if the printers are busy as suggested by Kumpf (see paragraph bridging columns 4 and 5).

18. Referring to claim 3, Terashima discloses requesting the stored data by introducing an identification pattern into a transmission request, the identification pattern associated with the data type being transmitted at the same time as the data being transmitted (see lines 1-41 of column 5; Note the "command codes" are interpreted as the identification pattern).

19. Referring to claim 4, Terashima discloses transmitting data both of the compressed and non-compressed data types further comprises transmitting the data identification pattern

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associated with the data type being transmitted at the same time as the data being transmitted (see lines 42-57 of column 5).

20. Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Terashima in view of Katsunori and further in view of Kumpf as applied to claim 1 above and further in view of Har et al. (U.S. Patent No. 6,310,563 hereinafter Har).

21. Referring to claim 8, the combination of Terashima, Katsunori, and Kumpf fails to disclose the method further comprising reading a word of the data in to a data decompression module every one half-clock cycle.

In an analogous method, Har teaches reading a word of the data into a data decompression module every one-half clock cycle (see lines 41-62 of column 11).

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the combination of Terashima, Katsunori, and Kumpf such that it comprises reading a word of the data in to a data decompression module every one half-clock cycle. One of ordinary skill in the art would have been motivated to make such modification in order to reduce potential bottlenecks in the system as suggested by Har (see lines 41-62 of column 11).

22. Referring to method claim 9, Har teaches multiplexing the different types of data and processing each type of data received in accordance with the type (see item labeled 180 figure 1).

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the combination of Terashima, Katsunori, and Kumpf with the above teaching of Har. One of ordinary skill in the art would have been motivated to make such modification in order to prevent errors from occurring due to processing data incorrectly.

Allowable Subject Matter

23. Claim 13 is allowed.

24. Claims 5-7, 10-12, 20-22, and 26-28 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

25. Applicant's arguments with respect to claims 1-12 have been considered but are moot in view of the new ground(s) of rejection.

26. Applicant's arguments regarding claim 14 filed 7/15/04 have been fully considered but they are not persuasive. The applicant argues:

1) The cited prior art fails to teach "transmitting distinct streams of data of both the compressed and non-compressed data types over each of a plurality of transmission paths."

As per argument 1, there is no limitation in claim 14 that requires transmitting distinct streams of data of both the compressed and non-compressed data types over each of a plurality of transmission paths. This limitation is present in claim 1, which has been rejected under new grounds. Terashima does teach all of the limitations of claim 14 (see rejection above).

Conclusion

27. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eron J Sorrell whose telephone number is 703 305-7800. The examiner can normally be reached on Monday-Friday 9:00AM - 5:30PM.

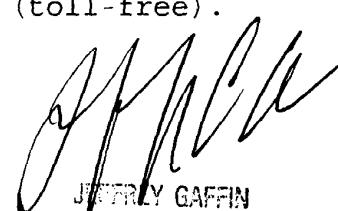
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jeffrey A Gaffin can be reached on 703 308-3301. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Effective October 13, 2004, the examiner can be reached at 571 272-4160 and the examiner's supervisor can be reached at 571 272-4146.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

EJS
September 28, 2004



JEFFREY GAFFIN
SEARCH/PATENT EXAMINER
TECHNOLOGY CENTER 2100

Notice of References CitedApplication/Control No.
09/891,032Applicant(s)/Patent Under
Reexamination
HANNA ET AL.Examiner
Eron J SorrellArt Unit
2182
Page 1 of 1**U.S. PATENT DOCUMENTS**

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
	A	US-6,412,022	06-2002	Kumpf et al.	710/1
	B	US-			
	C	US-			
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N	JP 05030366 A	02-1993	Japan	KATO, KATSUNORI	H04N 01/41
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
 Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

PAT-NO: JP405030366A
**DOCUMENT-
IDENTIFIER:** JP 05030366 A
TITLE: PICTURE OUTPUT METHOD
AND SYSTEM
PUBN-DATE: February 5, 1993

INVENTOR-INFORMATION:

NAME	COUNTRY
KATO, KATSUNORI	

ASSIGNEE-INFORMATION:

NAME	COUNTRY
CANON INC	N/A

APPL-NO: JP03178026

APPL-DATE: July 18, 1991

INT-CL H04N001/41 , B41J002/485 , B41J005/30 ,
(IPC): G06F015/64 , G06F015/66 , H04N001/23

ABSTRACT:

PURPOSE: To shorten time for transfer and transfer control
when a picture data is outputted.

CONSTITUTION: A picture data compression circuit 17
compresses a picture data while its picture area is designated
and the compressed picture data and the picture data not

compressed are transferred to a picture printer 2 in the order of picture areas. Thus, the picture printer 2 expands the compressed picture data among the transferred picture data and forms a picture based on the expanded picture data and the picture data not compressed.

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(19)日本国特許庁 (JP)

(12) 公開特許公報 (A)

(11)特許出願公開番号

特開平5-30366

(43)公開日 平成5年(1993)2月5日

(51)Int.Cl.
H 04 N 1/41
B 41 J 2/485
5/30
G 06 F 15/64

識別記号 Z 8839-5C
D 8807-2C
E 8840-5L
450 8804-2C

F I

技術表示箇所

B 41 J 3/12 Z
審査請求 未請求 請求項の数2(全8頁) 最終頁に統く

(21)出願番号 特願平3-178026

(22)出願日 平成3年(1991)7月18日

(71)出願人 000001007

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ノン株式会社内

(74)代理人 弁理士 大塚 康徳 (外1名)

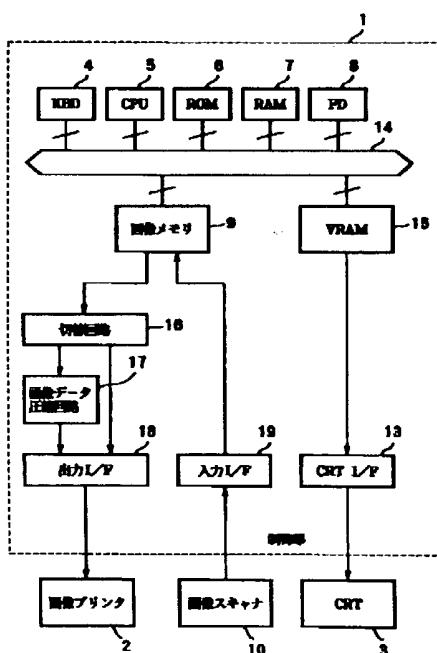
(54)【発明の名称】 画像出力方法及びシステム

(57)【要約】

【目的】 画像データを出力する時、その転送及び転送制御の時間を短くできる画像出力方法及びシステムを提供することを目的とする。

【構成】 画像データの画像領域を指定して画像データ圧縮回路17により圧縮し、その圧縮された画像データ及び圧縮されていない画像データを画像領域順に画像プリンタ2に転送する。これにより、画像プリンタ2は、その転送された画像データの内、圧縮されている画像データ部分を伸長し、その伸長した画像データ及び圧縮されていない画像データに基づいて、画像を形成するよう動作する。

第1図



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【特許請求の範囲】

【請求項1】 画像データを画像出力装置に出力して画像データの表示／出力を行う画像出力システムであつて、

画像データの画像領域を指定して圧縮する圧縮手段と、前記圧縮手段により圧縮された画像データ及び圧縮されていない画像データを画像領域順に画像出力装置に転送する転送手段と、

前記画像出力装置は、前記転送手段により転送された画像データの内、圧縮されている画像データを伸長する伸長手段と、

前記伸長手段により伸長された画像データ及び圧縮されていない画像データを基に画像を形成する画像形成手段と、

を有することを特徴とする画像出力システム。

【請求項2】 画像データを画像出力装置に出力して画像データの表示／出力を行う画像出力方法であつて、画像データの画像領域を指定して圧縮する工程と、

圧縮された画像データ及び圧縮されていない画像データを画像領域順に画像出力装置に転送する工程と、

その転送された画像データの内、圧縮されている画像データ部分を伸長する工程と、

その伸長された画像データ及び圧縮されていない画像データを基に画像を形成する工程と、

を有することを特徴とする画像出力方法。

【発明の詳細な説明】

【0001】

【産業上の利用分野】本発明は、画像データを画像出力装置に出力して画像データの表示／出力を行う画像出力方法及びシステムに関するものである。

【0002】

【従来の技術】ドット単位で画像を出力する画像出力装置では、1ドットに対して1ビットのデータが割当てられており、その画像データ全体を画像処理部から画像出力装置に転送して印刷が行われている。例えば、解像度が400 dpi (ドット/インチ) でA4サイズの原稿を印刷するためには、約2Mバイトの画像データを画像処理部より画像出力装置に転送する必要がある。また、スキャナ等の読み取り装置の場合も同様に、読み取った画像の1画素に対して1ビットのデータを割り当てて、画像処理部や画像出力装置に転送している。

【0003】

【発明が解決しようとする課題】このため上述のような従来のシステムでは、例えば前述したような解像度400 dpiでA4サイズの画像データを、画像処理部より画像出力装置に出力するためには約2Mバイトのデータ転送が必要となり、その転送及び転送制御に要する時間が長くなってしまう。また、画像出力部で品質の良い画像を得るために画像出力装置の解像度を、例えば600 dpiに上げると、画像データの転送に要する時間がま

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すます長くなってしまう。このような転送時間を短縮するためには高速で動作可能な回路が要求されるため、システムのコストアップまたはエラー率の増大等につながることとなる。

【0004】本発明は上記従来例に鑑みてなされたもので、画像データを出力する時、その転送及び転送制御の時間を短くできる画像出力方法及びシステムを提供することを目的とする。

【0005】

- 10 【課題を解決するための手段】上記目的を達成するためには本発明の画像出力システムは以下の構成を備える。即ち、画像データを画像出力装置に出力して画像データの表示／出力を行う画像出力システムであつて、画像データの画像領域を指定して圧縮する圧縮手段と、前記圧縮手段により圧縮された画像データ及び圧縮されていない画像データを画像領域順に画像出力装置に転送する転送手段と、前記画像出力装置は、前記転送手段により転送された画像データの内、圧縮されている画像データを伸長する伸長手段と、前記伸長手段により伸長された画像データ及び圧縮されていない画像データを基に画像を形成する画像形成手段とを有する。

- 20 【0006】上記目的を達成するために本発明の画像出力方法は以下の工程を備える。即ち、画像データを画像出力装置に出力して画像データの表示／出力を行う画像出力方法であつて、画像データの画像領域を指定して圧縮する工程と、圧縮された画像データ及び圧縮されていない画像データを画像領域順に画像出力装置に転送する工程と、その転送された画像データの内、圧縮されている画像データ部分を伸長する工程と、その伸長された画像データ及び圧縮されていない画像データを基に画像を形成する工程とを有する。

【0007】

【作用】以上の構成において、画像データの画像領域を指定して圧縮し、その圧縮された画像データ及び圧縮されていない画像データを画像領域順に画像出力装置に転送する。これにより、画像出力装置は、その転送された画像データの内、圧縮されている画像データ部分を伸長し、その伸長した画像データ及び圧縮されていない画像データに基づいて、画像を形成するように動作する。

40 【0008】

【実施例】以下、添付図面を参照して本発明の好適な実施例を詳細に説明する。

【0009】図1は、実施例における画像処理装置の構成を示すブロック図である。

【0010】図1において、1は文書データの作成、編集、及び画像プリンタ2を用いて印刷するために画像データを画像メモリ9より読み出して出力する制御部、更には画像スキャナ10より画像データを入力して画像メモリ9に記憶する入力制御などを行う制御部である。2は

- 50 制御部1から送られる画像データ(イメージデータ)に

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従って、記録紙等の記録媒体に画像を記録する画像プリンタで、ここでは例えばレーザビームプリンタ等で構成されている。10は画像スキャナで、原稿画像をCCDなどの撮像素子によって読み取り、その読み取った画像信号を画像データに変換して制御部1に出力している。3は文書データや画像データなどを表示するCRT等の表示部である。

【0011】次に制御部1の構成を説明すると、5はCPUであり、この制御部1全体の制御を行っている。6はROMであり、CPU5が実行する文書処理プログラムや各種データ等を記憶している。7はCPU5のワーカエリアとして使用されるRAMで、各種データを一時的に保存しており、例えば印刷のために展開する前の文書データ（文字コードデータ）等をも一時的に記憶することができる。8はフロッピーディスク（FD）であり、外部記憶装置として各種の文書データ・ファイル等を記憶する。4はキーボード（KBD）であり、文書データの作成・編集の他に各種の制御指令を与える。13はCRTインターフェース（CRTI/F）であり、CRT表示部3の表示を制御している。15はビデオRAM（VRAM）であり、表示用のイメージデータを記憶している。14はCPU5のシステムバスである。

【0012】9は画像メモリであり、ここには画像スキャナ10によって読み取られた画像データ、或いはCPU5の制御によって画像プリンタ2で印刷される印刷用のイメージデータが展開される。16は切替回路で、画像メモリ9より送られてくる画像データがデータ圧縮する画像領域であるか、圧縮しない領域であるかが指定されると、この指定に応じて画像データの転送先を切り替えていている。17は画像データ圧縮回路であり、切替回路16から転送されてくる画像データに対してデータ圧縮を行っている。18は出力I/Fであり、画像データ圧縮回路16により圧縮された画像データ、及び切替回路16から直接転送されてきた画像データを、その画像領域順に画像プリンタ2へ出力する。19は入力I/Fであり、画像スキャナ10にて読み取られた画像データの入力制御を行っている。

【0013】図2は画像プリンタ2の概略構成を示すブロック図である。

【0014】図2において、23は入力I/Fであり、制御部1から転送されてくる画像データの入力制御を行っている。22は切替回路で、制御部1より指示された圧縮された画像領域であるか、圧縮されていない画像領域であるかの指定に応じて、入力I/F23を通して入力した画像データの転送先を切り替えている。21は画像データ伸長回路であり、入力I/F23を通して入力されたデータのうち切替回路22で切り替えられて入力される、圧縮された画像領域の画像データのみを伸長している。20は画像形成部であり、画像データ伸長回路21にて伸長された画像データ及び切替回路22から直

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接転送されてくる圧縮されていない画像データ領域の画像データに基づいて記録媒体に記録を行って画像を形成している。

【0015】以上の構成における画像データの形成処理について説明する。画像メモリ9に展開される画像データは、制御部1内にて発生される文字パターン、図形記号と、画像スキャナ10によって読み込まれた画像データの合成によって作成される。その画像作成および画像データの合成作業はオペレータによりキーボード4を用いて行われる。このように作成された画像のうち制御部1内にて発生される文字、および図形記号は画像としての圧縮率が高い。それに対して画像スキャナ10の読み取りによる画像データは写真データ等の圧縮率の低いデータである。この写真等の画像データは圧縮により画像データ量が増加する場合もある。このことにより画像スキャナ10の読み取りによる画像データの領域は画像圧縮しない領域とする。制御部1内にて発生された文字および図形記号の領域は画像圧縮する領域とする。この圧縮／非圧縮の領域の情報は画像プリントの直前に制御部1から画像プリンタ2へ伝達される。画像プリンタ2はその情報を受け取り、その情報を基に切り替え回路22を制御しながら画像形成を行う。

【0016】次に、図2の構成からなる画像プリンタ2における画像印刷処理について説明する。制御部1において、オペレータがキーボード（KBD）4等を用いて作成した画像データ、或いはFD8などから読み出された画像データは画像メモリ9に展開されて記憶される。この画像メモリ9に展開された画像データは、切替回路16に転送される。この切替回路16では、画像データに含まれている画像領域の指定により、データ圧縮を行う画像領域であるか否かを判別し、圧縮すべき画像領域のデータであればその領域の画像データを画像データ圧縮回路17に転送している。一方、データ圧縮を要しない画像領域のデータであれば、直接出力I/F18に転送する。

【0017】これにより、画像データ圧縮回路17は、切替回路16から転送されたデータ圧縮されるべき画像領域の画像データを圧縮して出力I/F18に転送する。この出力I/F18では、画像データ圧縮回路17から転送されてくる圧縮された画像データと、切替回路16から直接転送されてくる圧縮されていない画像データとを画像領域の順に画像プリンタ2に転送する。このようにして、画像プリンタ2には、圧縮された画像データと、圧縮されていない画像データとが、その画像領域の順に転送されることになる。

【0018】次に図2のブロック図を参照して画像プリンタ2の動作を説明すると、入力I/F23から入力された画像データは、切替回路22に転送される。切替回路22には、予め制御部1から画像データ圧縮する画像領域としない領域の指定がなされているため、その領域

指定に従って、入力 I/F 23 から転送されてくる画像データの転送先を画像データ伸長回路 21 或いは画像形成部 20 に切り替えていく。即ち、データ圧縮されている画像領域の画像データは画像データ伸長回路 21 へ転送され、データ圧縮されていない画像領域の画像データは画像形成部 20 へ直接転送される。尚、ここで、切替回路 22 と画像データ伸長回路 21 の動作タイミングによって、画像データの画像領域順に画像形成部 20 に画像データが転送される。こうして、その画像データに基づいて、画像形成部 20 において記録媒体に画像が記録される。

【0019】以上のように、制御部 1 から画像プリンタ 2 へ転送して印刷する画像データのうち、効率的にデータ圧縮できる画像領域は画像データ圧縮回路 17 によりデータ圧縮して転送することにより、転送するデータ数を少なくして、転送及び転送制御時間を短くすることができる。また、これにより、転送レートを低く抑えることも可能になる。

【0020】図3は画像プリント時の制御部 1 の動作を示すフローチャートであり、図4は画像プリント時における画像プリンタ 2 の動作を示すフローチャートである。以下図4及び図5のフローチャートに従って、画像プリンタ 2 における画像プリント動作を説明する。

【0021】まずステップ S 1 において、制御部 1 の動作を開始し、次にステップ S 2 でプリントする画像データを画像メモリ 9 に展開する。ステップ S 3 で切替回路 16 に画像データを順次転送する。次にステップ S 4 に進み、切替回路 16 は画像メモリ 9 から転送されてくる画像データに対して、データ圧縮する画像領域の画像データか、データ圧縮しない画像領域画像データかを判定をする。そして、データ圧縮する画像領域の画像データであればステップ S 5 に進み、画像データ圧縮回路 17 に出力する。一方、データ圧縮しない画像領域のデータであればステップ S 6 に進み、出力 I/F 18 に直接出力する。

【0022】こうしてステップ S 6 では、画像データ圧縮回路 17 にて圧縮された画像データ、或いは切替回路 16 から直接転送された圧縮されていない画像データとが画像データ領域順に順次出力 I/F 18 を通して画像プリンタ 2 へ出力される。次にステップ S 7 に進み、画像メモリ 9 内の画像データが全て出力されたかどうかを判定し、画像メモリ 9 の画像データの全てが出力されていないならばステップ S 3 に戻り、前述した動作を繰り返す。こうして、画像メモリ 9 の画像データが全て出力されてしまうとステップ S 8 に進み、印刷動作を終了する。

【0023】次に、図4のフローチャートを参照して、画像プリンタ 2 の動作を説明する。まずステップ S 10 で、画像プリンタ 2 の動作が開始され、ステップ S 11 で制御部 1 から転送されてくる画像データを入力 I/F

23 を通して入力する。次にステップ S 12 に進み、ステップ S 11 で入力した画像データを切替回路 22 に転送する。ステップ S 13 では、圧縮されている画像領域の画像データか、圧縮されていない画像領域の画像データかを判定し、圧縮されている画像領域の画像データであればステップ S 14 に進み、その画像データを画像データ伸長回路 21 に出力する。一方、圧縮されていない画像領域の画像データであればステップ S 15 に進み、画像形成部 20 に直接出力する。

10 【0024】こうして、ステップ S 14 では圧縮されている画像領域の画像データが、画像データ伸長回路 21 にてデータ伸長され、ステップ S 15 では画像形成部 20 において、伸長された画像データまたは切替回路 22 から直接転送された圧縮されていない画像データに基づいて画像プリント出力が行われる。次にステップ S 16 では全画像のプリント出力が終了したかどうかを判定し、全画像のプリント出力が終了したならばステップ S 15 に進み、画像プリンタ 2 における画像プリント動作を終了する。

20 【0025】尚、本発明は複数の機器から構成されるシステムに適用しても、1つの機器からなる装置に適用しても良い。また、本発明はシステム或は装置に、本発明を実施するプログラムを供給することによって達成される場合にも適用できることはもちろんである。

【0026】以上説明したように本実施例によれば、画像プリント時、制御部から画像プリンタへ転送する画像データのうち効率的に圧縮のできる画像領域のデータを圧縮して転送することにより、転送及び転送制御にかかる時間を短くできる効果がある。

30 【0027】
【発明の効果】以上説明したように本発明によれば、画像データを画像出力装置に出力する時、その転送時間及び転送制御に要する時間を短くできる効果がある。

【図面の簡単な説明】

【図1】本実施例の画像処理装置の概略構成を示すブロック図である。

【図2】本実施例の画像処理装置に接続された画像プリンタの概略構成を示すブロック図である。

40 【図3】本実施例の画像処理装置の制御部における画像プリント時の動作を示すフローチャートである。

【図4】本実施例の画像プリンタにおける画像プリント時の動作を示すフローチャートである。

【符号の説明】

- 1 制御部
- 2 画像プリンタ
- 3 画像スキヤナ
- 5 CPU
- 9 画像メモリ
- 10 表示部
- 16, 22 切替回路

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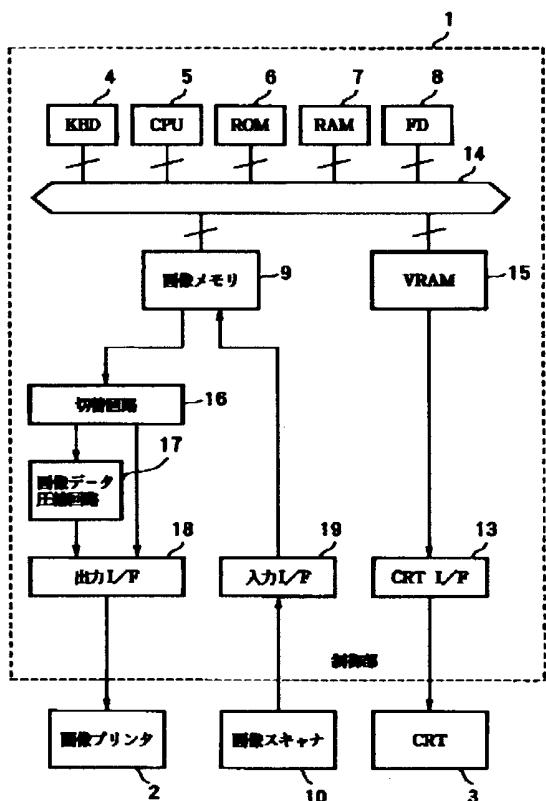
17 画像データ圧縮回路

21 画像データ伸長回路

20 画像形成部

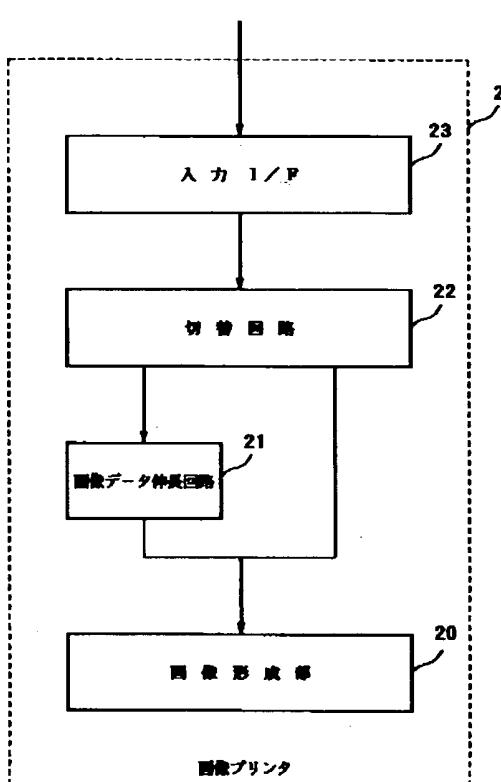
【図1】

第1図



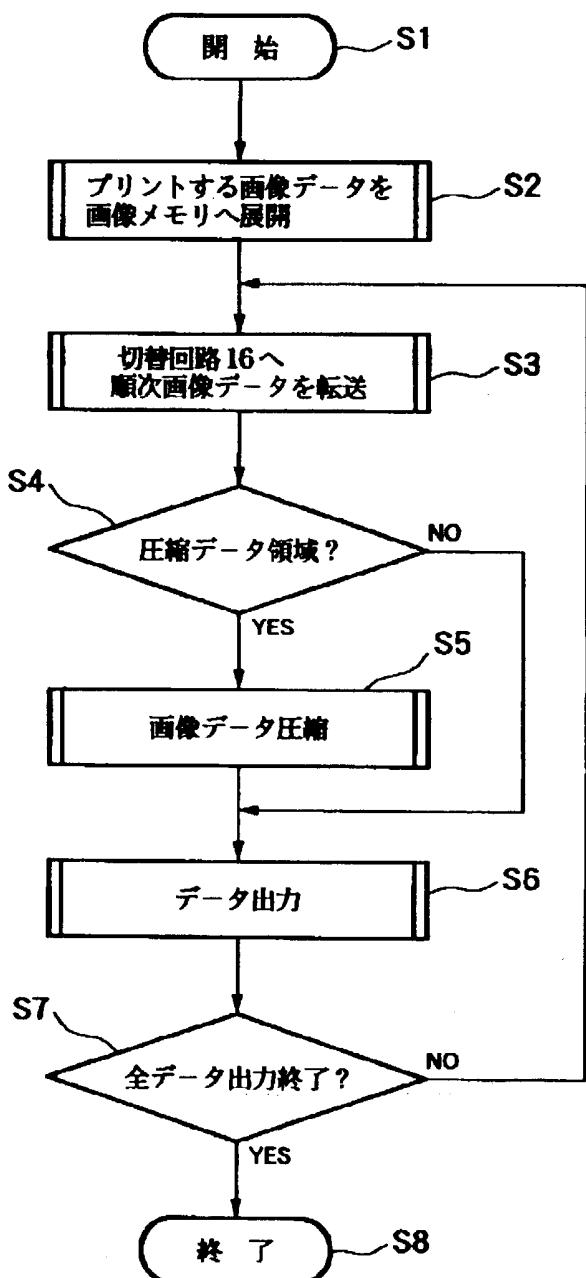
【図2】

第2図



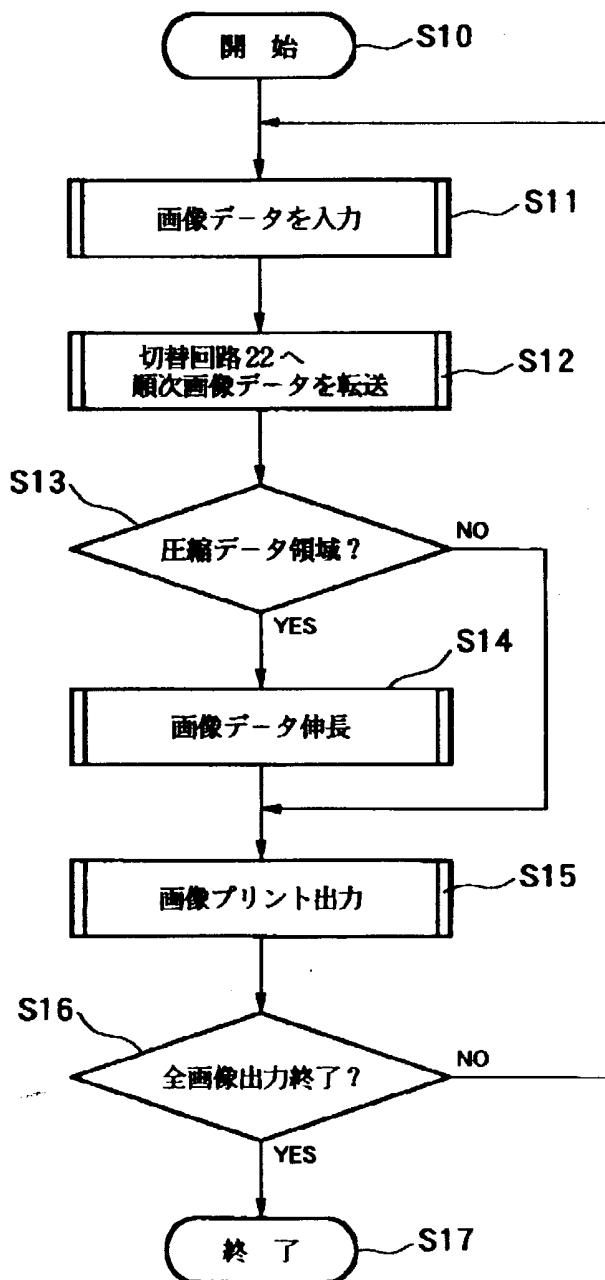
【図3】

第 3 図



【図4】

第 4 図



フロントページの続き

(51) Int. Cl. ⁵	識別記号	序内整理番号	F I	技術表示箇所
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H 04 N 1/23	Z	9186-5C		

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DETAILED DESCRIPTION**[Detailed Description of the Invention]**

[0001]

[Industrial Application] This invention relates to the image output method and system which output image data to an image output unit, and perform a display/output of image data.

[0002]

[Description of the Prior Art] In the image output unit which outputs an image per dot, 1-bit data are assigned to 1 dot, the whole image data is transmitted to an image output unit from the image-processing section, and printing is performed. For example, in order for resolution to print the manuscript of A4 size by 400dpi (dots per inch), it is necessary to transmit about 2 M bytes of image data to an image output unit from the image-processing section. Moreover, in readers, such as a scanner, 1-bit data were similarly assigned to 1 pixel of the read image, and it has transmitted them to the image-processing section or an image output unit.

[0003]

[Problem(s) to be Solved by the Invention] For this reason, in the above conventional systems, by resolution 400dpi which was mentioned above, for example, in order to output the image data of A4 size to an image output unit from the image-processing section, about 2 M bytes of data transfer will be needed, and the time amount which that transfer and transfer control take will become long. Moreover, in order to obtain the good image of image quality in the image output section, the time amount which an image data transfer will take it if the resolution of an image output unit is raised to for example, 600dpi will become still longer. Since the circuit which can operate at high speed in order to shorten such the transfer time is required, it will lead to the increase which is a cost rise or error rate of a system.

[0004] This invention aims at offering the image output method and system which can shorten time amount of the transfer and transfer control, when it is made in view of the above-mentioned conventional example and image data is outputted.

[0005]

[Means for Solving the Problem] In order to attain the above-mentioned purpose, the image output system of this invention is equipped with the following configurations. Namely, a compression means to be the image output system which outputs image data to an image output unit, and performs a display/output of image data, and to specify and compress the image field of image data; A transfer means to transmit the image data compressed by said compression means, and the image data which is not compressed to an image output unit in order of an image field; and said image output unit. It has an expanding means to elongate the image data compressed among the image data transmitted by said transfer means, and an image formation means to form an image based on the image data elongated by said expanding means, and the image data which is not compressed.

[0006] In order to attain the above-mentioned purpose, the image output method of this invention is equipped with the following processes. Namely, the process which is the image output method which outputs image data to an image output unit, and performs a display/output of image data, and specifies and compresses the image field of image data, The process which transmits the compressed image data and the image data which is not compressed to an image output unit in order of an image field; It has the process which elongates a part for the image data division compressed among the transmitted image

~~data, and the process which forms an image based on the elongated image data and image data which is not compressed.~~

[0007]

[Function] In the above configuration, the image field of image data is specified and compressed and the compressed image data and image data which is not compressed are transmitted to an image output unit in order of an image field. Thereby, an image output unit elongates a part for the image data division compressed among the transmitted image data, and based on the elongated image data and image data which is not compressed, it operates so that an image may be formed.

[0008]

[Example] Hereafter, the suitable example of this invention is explained to a detail with reference to an accompanying drawing.

[0009] Drawing 1 is the block diagram showing the configuration of the image processing system in an example.

[0010] In drawing 1, 1 is a control section which performs the control section which reads and outputs image data from an image memory 9, the input control which inputs image data and is further memorized from the image scanner 10 to an image memory 9, in order to print using creation of document data, edit, and the image printer 2. According to the image data (image data) sent from a control section 1, 2 is the image printer which records an image on record media, such as detail paper, and consists of for example, laser beam printers etc. here. 10 is an image scanner, it reads a manuscript image with image sensors, such as CCD, changes the read picture signal into image data, and is outputting it to the control section 1. 3 is displays, such as CRT which displays document data, image data, etc.

[0011] Next, if the configuration of a control section 1 is explained, 5 is CPU and is controlling this control-section 1 whole. 6 is ROM and has memorized a document processing system program, various data, etc. which CPU5 performs. 7 is RAM used as a work area of CPU5, and can memorize temporarily document data (character code data) before saving various data temporarily, for example, developing for printing etc. 8 is a floppy disk (FD) and memorizes various kinds of document data files etc. as external storage. 4 is a keyboard (KBD) and gives various kinds of control commands besides creation and edit of document data. 13 is a CRT interface (CRTI/F) and is controlling the display of the CRT display section 3. 15 is a Video RAM (VRAM) and has memorized the image data for a display. 14 is the system bus of CPU5.

[0012] 9 is an image memory and the image data read with the image scanner 10 or the image data for printing printed by control of CPU5 by the image printer 2 is developed here. If it is specified whether 16 is an electronic switch and is an image field as for which the image data sent from an image memory 9 carries out a data compression, or it is the field which is not compressed, it has changed the image data transfer point according to this assignment. 17 is an image data compression circuit and is performing the data compression to the image data transmitted from an electronic switch 16. 18 is output I/F and outputs the image data compressed by the image data compression circuit 16 and the image data by which transfer direct has been carried out from an electronic switch 16 to the image printer 2 in order of the image field. 19 is input I/F and is performing image entry-of-data control read with the image scanner 10.

[0013] Drawing 2 is the block diagram showing the outline configuration of the image printer 2.

[0014] In drawing 2, 23 is input I/F and is performing image entry-of-data control transmitted from a control section 1. According to assignment of whether 22 is an electronic switch and is the compressed image field which was directed from the control section 1, or to be the image field which is not compressed, the image data transfer point inputted through input I/F23 is changed. 21 is an image data decompression circuit and is elongating only the image data of the compressed image field changed and inputted in an electronic switch 22 among the data inputted through input I/F23. 20 is the image formation section, records on a record medium based on the image data of the image data area by which transfer direct is carried out from the image data elongated in the image data decompression circuit 21, and an electronic switch 22 and which is not compressed, and forms the image.

[0015] Formation processing of the image data in the above configuration is explained. The image data developed by the image memory 9 is created by the character pattern and graphic symbol which are generated within a control section 1, and composition of the image data read with the image scanner 10.

The image creation and composition of image data are performed by the operator using a keyboard 4. Thus, the alphabetic character generated within a control section 1 among the created images and a graphic symbol have the high compressibility as an image. The image data according to reading of the image scanner 10 to it is data with the low compressibility of photograph data etc. The image amount of data may increase image data, such as this photograph, by compression. Let the field of the image data based on reading of the image scanner 10 be the field which does not carry out picture compression by this. Let the field of the alphabetic character generated within the control section 1, and a graphic symbol be the field which carries out picture compression. The information on this compression / incompressible field is transmitted to the image printer 2 from a control section 1 just before an image print. The image printer 2 performs image formation, changing the information based on reception and its information, and controlling a circuit 22.

[0016] Next, the image printing processing in the image printer 2 which consists of a configuration of drawing 2 is explained. In a control section 1, the image data read from the image data which the operator created using the keyboard (KBD) 4 grade, or FD8 is developed and memorized in an image memory 9. The image data developed by this image memory 9 is transmitted to an electronic switch 16. In this electronic switch 16, by assignment of the image field included in image data, it distinguished whether it was the image field which performs a data compression, and if it is data of the image field which should be compressed, the image data of that field will be transmitted to the image data compression circuit 17. On the other hand, if it is data of the image field which does not require a data compression, it will transmit to direct-output I/F18.

[0017] Thereby, the image data compression circuit 17 compresses the image data of the image field which was transmitted from the electronic switch 16 and by which a data compression should be carried out, and transmits it to output I/F18. In this output I/F18, the compressed image data which is transmitted from the image data compression circuit 17 and the image data by which transfer direct is carried out from an electronic switch 16 and which is not compressed are transmitted to the image printer 2 in order of an image field. Thus, the compressed image data and the image data which is not compressed will be transmitted to the image printer 2 in order of the image field.

[0018] Next, if actuation of the image printer 2 is explained with reference to the block diagram of drawing 2, the image data inputted from input I/F23 will be transmitted to an electronic switch 22. The image data transfer point transmitted to an electronic switch 22 from input I/F23 according to the block definition since the assignment of a field which is not made into the image field which carries out image data compression from a control section 1 beforehand is made is changed to the image data decompression circuit 21 or the image formation section 20. That is, transfer direct of the image data of the image field by which the image data of the image field by which the data compression is carried out is transmitted to the image data decompression circuit 21, and a data compression is not carried out is carried out to the image formation section 20. In addition, image data is transmitted to the image formation section 20 by the timing of an electronic switch 22 and the image data decompression circuit 21 of operation in order of the image field of image data here. In this way, based on the image data, an image is recorded on a record medium in the image formation section 20.

[0019] As mentioned above, by carrying out a data compression by the image data compression circuit 17, and transmitting, the image field which can carry out a data compression efficiently among the image data which transmits to the image printer 2 and is printed from a control section 1 can lessen the number of data to transmit, and can shorten transfer and transfer control time amount. Moreover, thereby, it also becomes possible to stop a transfer rate low.

[0020] Drawing 3 is a flow chart which shows actuation of the control section 1 at the time of an image print, and drawing 4 is a flow chart which shows actuation of the image printer 2 at the time of an image print. According to the flow chart of drawing 4 and drawing 5, the image print actuation in the image printer 2 is explained below.

[0021] First, actuation of a control section 1 is started in step S1, and the image data printed at step S2 next is developed to an image memory 9. The sequential transfer of the image data is carried out at step S3 in an electronic switch 16. Next, it progresses to step S4 and an electronic switch 16 judges the image data of the image field which carries out a data compression, and the image field image data which does not carry out a data compression to the image data transmitted from an image memory 9. And if it is the image data of the image field which carries out a data compression, it will progress to step S5 and will

output to the image data compression circuit 17. On the other hand, if it is data of the image field which does not carry out a data compression, it will progress to step S6 and a direct output will be carried out to output I/F18.

[0022] In this way, at step S6, the image data compressed in the image data compression circuit 17 or the image data by which transfer direct was carried out from the electronic switch 16 and which is not compressed is outputted to the image printer 2 through sequential output I/F18 in order of an image data area. Next, it progresses to step S7 and judges whether all the image data in an image memory 9 was outputted, and if all the image data of an image memory 9 is not outputted, return and the actuation mentioned above will be repeated to step S3. In this way, if all the image data of an image memory 9 is outputted, it will progress to step S8 and printing actuation will be ended.

[0023] Next, actuation of the image printer 2 is explained with reference to the flow chart of drawing 4. First, at step S10, actuation of the image printer 2 is started and the image data transmitted from a control section 1 at step S11 is inputted through input I/F23. Next, it progresses to step S12 and the image data inputted at step S11 is transmitted to an electronic switch 22. At step S13, the image data of the image field compressed and the image data of the image field which is not compressed is judged, if it is the image data of the image field compressed, it will progress to step S14 and the image data will be outputted to the image data decompression circuit 21. On the other hand, if it is the image data of the image field which is not compressed, it will progress to step S15 and a direct output will be carried out to the image formation section 20.

[0024] In this way, at step S14, data decompression of the image data of the image field compressed is carried out in the image data decompression circuit 21, and an image printed output is performed in the image formation section 20 based on the image data by which transfer direct was carried out and which is not compressed from the elongated image data or an electronic switch 22 in step S15. Next, at step S16, it judges whether the printed output of all images was completed, if the printed output of all images is completed, it will progress to step S15, and the image print actuation in the image printer 2 is ended.

[0025] In addition, even if it applies this invention to the system which consists of two or more devices, it may be applied to the equipment which consists of one device. Moreover, as for this invention, it is needless to say that it can apply also when attained by supplying the program which carries out this invention to a system or equipment.

[0026] As explained above, according to this example, there is effectiveness which can shorten time amount concerning a transfer and transfer control by compressing and transmitting the data of the image field which can do compression efficiently among the image data transmitted to an image printer from a control section at the time of an image print.

[0027]

[Effect of the Invention] As explained above, when outputting image data to an image output unit according to this invention, there is effectiveness which can shorten time amount which the transfer time and transfer control take.

[Translation done.]